

Health Consultation

Chris V8 Shop Custer, Whatcom County, Washington

August 15, 2002

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Prepared by

**The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**



Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. Health consultations focus on specific health issues so that DOH can respond quickly to requests from concerned residents or agencies for health information on hazardous substances. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this Health Consultation, please call the health advisor who prepared this document:

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Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Aquifer	An underground formation composed of materials such as sand, soil, or gravel that can store and/or supply groundwater to wells and springs.
Carcinogen	Any substance that can cause or contribute to the production of cancer.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Dose	A dose is the amount of a substance that gets into the body through ingestion, skin absorption or inhalation. It is calculated per kilogram of body weight per day.
Environmental Media Evaluation Guide (EMEG)	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on ATSDR's <i>minimal risk level</i> (MRL).

Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short-term (acute) or long-term (chronic).
Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes.
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Indeterminate public health hazard	Sites for which no conclusions about public health hazard can be made because data are lacking.
Media	Soil, water, air, plants, animals, or any other part of the environment that can contain contaminants.
Model Toxics Control Act (MTCA)	The hazardous waste cleanup law for Washington State.
No apparent public health hazard	Sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.

Plume	An area of contaminants in a specific media such as groundwater.
Reference Dose Media Evaluation Guide (RMEG)	A concentration in air, soil, or water below which adverse non-cancer health effects are not expected to occur. The EMEG is a <i>comparison value</i> used to select contaminants of potential health concern and is based on EPA's oral reference dose (RfD).
Route of exposure	The way in which a person may contact a chemical substance that includes ingestion, skin contact and breathing.
U.S. Environmental Protection Agency (EPA)	Established in 1970 to bring together parts of various government agencies involved with the control of pollution.

Background and Statement of Issues

The Washington State Department of Health (DOH) has prepared this health consultation at the request of the Whatcom County Health and Human Services Department (WCHHS) to evaluate the potential human health risks associated with lead contamination in soil, and possibly groundwater, near a former auto repair business. WCHHS has been investigating this facility due to a complaint filed to Department of Ecology's Northwest Regional Office on May 7, 1991 regarding storage of 30 rusty and leaking drums of used motor oil.¹

From 1962 until August of 2000, Chris V8 Shop operated as an auto repair business from a residence at 7786 Portal Way, Custer, Washington, in northwest Whatcom County, (Figure 1). The surrounding area is relatively flat, rural/agricultural, and adjacent to a golf course. WCHHS performed a site hazardous assessment on April 10, 2001. A site inspection revealed stained soil in several areas. Several soil samples were taken and analyzed for petroleum compounds and hydrocarbons and EPA Priority Pollutant Metals (Table 1).

Table 1
Contaminants detected August, 2001, in soil
at the former Chris V8 Shop located in Custer, WA (mg/kg)

Chemical	Maximum concentration behind shop in stained area	Composite of all soil samples	Health Comparison Value
Gasoline	1400	ND	300 (Child RMEG)*
Diesel	4800	NA	300 (Child RMEG)*
Heavy (lube) Oil	6200	2300	300 (Child RMEG)*
Lead	1000	650	NA
Cadmium	ND	2.49	10 (Child EMEG)

* - based on pyrene as a surrogate

RMEG - EPA's Reference Dose Media Evaluation Guide

NA - Not available

ND - Not detected

EMEG - ATSDR's Environmental Media Evaluation Guide

mg/Kg - milligrams per kilogram

Child EMEG - ATSDR's Environmental Media Evaluation Guide for children

The owner and his wife continue to live at their residence. An on-site drinking water well is located approximately 60 feet east of the stained soil area behind the shop and is believed to draw from 25 feet below ground surface (Figure 2). The groundwater gradient is believed to be southeast toward the Nooksack River. WCHHS sampled the well in August of 2001, and found no petroleum compounds. Analysis of lead and cadmium was not performed. Another residential

drinking water well located on an adjacent property approximately 80 feet down-gradient and southeast of the contaminated area has not been sampled.

A site visit was performed on June 19, 2002, by the Department of Health. Observations included the shop, stained soil area, residential drinking water well, and the approximate area of the neighbors drinking water well. The wife of the owner stated that she had been drinking the water for many years. The shop does not appear to be used anymore and the stained soil area behind the shop has become overgrown with vegetation. The area between the stained soil area and the two drinking water wells is covered with lawn.

Discussion

Site environmental sampling data were screened using federal (ATSDR and EPA), and state (MTCA method B) health-based criteria (comparison values). Comparison values are media-specific concentrations used to select environmental contaminants for further evaluation. Contaminant concentrations below comparison values are unlikely to pose a health threat, and were not further evaluated in this health consultation. Contaminant concentrations exceeding comparison values (Table 1) do not necessarily pose a health threat, but were further evaluated as contaminants of concern to determine whether they are at levels which could result in adverse human health effects.

A potential exposure pathway exists for residents drinking water from both the on-site and off-site drinking water wells located near contaminated soil areas at the Chris V8 Shop. A single sample from the on-site well did not detect petroleum hydrocarbons. Neither well has been sampled for lead, cadmium, any other metals or volatile organic compounds (VOCs).

Groundwater is believed to move southeast from the site. The on-site well is located approximately 60 feet from the contaminated area, but slightly south and cross gradient of a potential contaminant plume. The neighbors well is located approximately 80 feet from the contaminated area, but more directly down-gradient to the southeast.

Another potential pathway is ingestion or dermal contact with lead in soil. Children between 1 and 2 years of age are the most susceptible to increased blood lead levels resulting from exposure to lead in soil.² The most sensitive toxic effect from lead exposure in children involves behavioral changes resulting from nervous system toxicity. Many of these behavioral changes involve impaired learning ability including decreased performance on IQ tests.³ Currently, no children live at the Chris V8 residence, therefore, exposure to lead in soil is expected to be minimal.

The most recent soil sampling by WCHHS in the stained soil area showed lead contamination as high as 1000 ppm with an average composite of 650 ppm. If young children played frequently in this area with this concentration of lead in soil, their blood lead level could approach a level of concern. ATSDR considers a blood lead level of 10 micrograms/deciliter or greater as an

indication of excessive lead exposure. Evidence exists to indicate that health effects in young children may occur at blood lead levels as low as 6 ug/dl.²

Child Health Initiative

The potential for exposure and associated adverse health effects are often increased for young children as opposed to older children or adults. ATSDR and DOH recognize that children are susceptible to developmental toxicity that can occur at levels much lower than those causing other types of toxicity.

DOH evaluated the likelihood of adverse health effects for young children exposed to lead in soil at the Chris V8 Shop. Since, there are no children living at this residence, no adverse health effects would be expected to result from exposure to lead in soil. However, the contaminated area behind the shop is not restricted and is adjacent to the owners residential yard area. If future occupants include young children, exposure to lead in soil at this site should be reevaluated..

Conclusions

1. The on-site and neighboring residential drinking water wells located near the contaminated area behind the Chris V8 Shop have not been sampled for lead, cadmium or any volatile organic compounds. Therefore, exposure to contaminants in drinking water is considered an *indeterminate public health hazard*.
2. Exposure to lead in soil at the Chris V8 Shop site represents *no apparent public health hazard*. Based on lead concentration in soil behind the shop and the fact that no children currently live at this address, exposure is not expected to result in adverse health effects. However, if future occupants include young children, exposure to lead in soil may be of concern.

Recommendations/ Public Health Action Plan

1. The on-site and off-site drinking water wells located near the Chris V8 Shop should be sampled for lead, cadmium, and VOCs. Results should be provided to the Department of Health.
2. At the current time there are no children living on site. As such, there are no recommendations with respect to lead in soil behind the shop. However, if future occupants include young children, the area behind the shop should be cleaned up or restricted.
3. Future environmental results should be provided to DOH for evaluation of potential health impacts.

Public Health Action Plan

Copies of this health consultation will be distributed to Whatcom County Health and Human Services Department, Washington State Department of Ecology, and Chris V8 Shop.

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REFERENCES

1. Ecology Worksheet 1, Summary Score Sheet, Chris V8 Shop, August 28, 2001 Update.
2. Toxicological Profile for Lead, US Public Health Service, ATSDR, April 1993.
3. Environmental Protection Agency, March 8, 1994, Integrated Exposure Uptake Biokinetic Model for Lead, Version 0.99D.

Figure 1

Figure 2

Certification

This Health Consultation was prepared by the Washington State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

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The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

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